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NEW SPECIES OF NORTH AMERICAN COLEOPTERA

BY EDWIN C. VAN DYKE
California Academy of Sciences, San Francisco

CARABIDAE

Nebria intermedia Van Dyke, new species

Of moderate size and rather robust, rufopiceous, the head and disc of pronotum piceous the antennae, legs, lateral margins of prothorax and elytra as well as sutural intervals of elytra rufous. Head five sixths breadth of prothorax, eyes rather prominent though less than hemispherical, antennae long and delicate, reaching at least four segments posterior to humeral angles of elytra, the pair of light colored spots between the eyes rarely present or if so faint. Prothorax two thirds as long as broad, less than three fourths as broad as elytra, apex feebly biemarginate, apical angles prominent, sides broadly, evenly arcuate in front, obliquely narrowed and feebly sinuate posteriorly, the hind angles prominent and obtuse though sharply pointed, basal margin transverse; the disc convex with the median longitudinal and anterior and posterior transverse impressions well defined, the latter punctured, and the basal area finely rugosely punctured, the lateral margins broad and moderately reflexed. Elytra square shouldered, parallel sided, about three times as long as prothorax, the disc more or less flattened, striae well impressed, finely and in most cases obscurely punctured, the intervals in general quite flattened, the third with four or sometimes five foveae close to the third stria, the humeral angles rounded and prominent, lateral margin narrowly reflexed. Legs long and delicate. Wings fully developed, and as long as entire beetle. Length 10 mm., breadth 4.25 mm.

Holotype male, *allotype* female, Nos. 6008 and 6009 C.A.S. Ent., and eleven paratypes collected by myself in the LOGAN PASS, GLACIER NATIONAL PARK, MONTANA, July 8, 1938. Besides these I have a series of close to a hundred specimens of the same species from various places in the northern Rocky Mountains of Montana, Alberta and British Columbia as well as from the more elevated areas of south central British Columbia and Mr. Bonaparte in Okanagon County, Washington.

This species superficially looks much like *Nebria labradorica* Casey and was for some time confused with it. It differs primarily from *labradorica* in being more graceful, less compact, with less

pronounced frontal impressions, the prothorax with the sides less broadly rounded in front, more gradually narrowed and sinuate posteriorly, with the hind angles feebly obtuse, not with the sides suddenly constricted and with the hind angles definitely right angled as is the case with most *labradorica*. The elytral foveae are also in general less marked. From *Nebria crassicornis* Van Dyke, of the high northern Cascades, which it also somewhat resembles, it differs by being less robust, with the antennae longer and finer, the head and prothorax considerably smaller especially as regards breadth and by having the sides of prothorax not suddenly constricted behind and the hind angles right angled. All three have the same greasy, rufo-piceous appearance.

Schizogenius peninsularis Van Dyke, new species

Medium sized for the genus, narrow, sybcylindrical, piceous, the pronotum and elytra aeneous, and the antennae and legs rufous. Head with clypeus tridentate, front with three lateral longitudinal sulci and a broader median sulcus narrowed in front; eyes moderately prominent; antennae rather short, moniliform, reaching to about middle of prothorax, the segments sixth to tenth transverse. Prothorax convex, subquadrate, narrowed forwards, the median, lateral and anterior transverse grooves well marked, the lateral barely reaching middle of pronotum and slightly convergent, two lateral setae, one near front angles and the second (sometimes absent) near hind angles. Elytra convex, about three times as long as broad, striae deeply impressed and rather closely, coarsely punctured from base to declivity, the intervals convex, the third, fifth, and seventh with a few fine setiferous punctures. The anterior tibiae more or less palmate, with three outer blunt and two inner acute teeth. Length 5 mm., breadth 1.5 mm.

Holotype, No. 6010, C.A.S. Ent., and several designated paratypes from 5 miles south of MIRAFLORES, LOWER CALIFORNIA, July 10, 1938, collected by Michelbacher and Ross. Besides these in the series of twenty three are others from Triumfo, July 7, 1938, and 5 miles west of San Bartola, July 13, 1938, likewise collected by Michelbacher and Ross.

This species superficially resembles several in our fauna such as *lineatus* Say and *litigiosus* Fall but these species are in general larger, a bit broader and flatter, with longer antennae which have the median segments longer than broad. This species also seems to be even more closely related to the Mexican *truquii* Putzeys, but the description of this omits to mention certain characters which would be needed to confirm the surmise.

Rhadine rossi Van Dyke, new species

Rather small and gracefully formed with long delicate antennae and legs, pale rufocastaneus, unicolorous. Head about a sixth longer than broad, somewhat elliptical in shape, the disc smooth, with feeble lateral rugose longitudinal impressions, the mandibles porrect and quite prominent, projecting but slightly beyond the sides of head; the basal region short and with oblique sides; antennae long, extending almost to middle of elytra, the third segment about one fourth longer than fourth. Prothorax cordate, slightly longer than broad, apex feebly emarginate, with anterior angles acutely rounded and feebly extending forwards, the sides broadly arcuate in front, oblique and convergent from posterior third to hind angles which are small though distinct, right angled and elevated, base deeply emarginate, the disc convex, smooth and shining, the median longitudinal and posterior transverse impressions distinct, the sides deplanate, the lateral margin rather broadly reflexed. Elytra elongate elliptical, a third longer than broad, feebly convex, finely striate, the striae shallowly but distinctly impressed and finely, somewhat obscurely punctured, intervals quite flat, the third sometimes with a few vague foveae, the apices obliquely sinuate, the sutural angles short and divergent, the submarginal punctures numerous and distinct, and the lateral margin rather broadly reflexed. Front tarsi with distinct median groove above, the middle and hind with less distinct median grooves but also with lateral grooves. Length 10 mm., breadth 4 mm.

Holotype male, *allotype* female, Nos. 6011 and 6012, C.A.S. Ent., and numerous designated paratypes from a series of 97 specimens trapped in pocket gophers (*Geomys*) burrows near SOMERSET and SAN ANTONIO, TEXAS, during November, 1942, by Dr. E. S. Ross and A. J. Kirn.

This species resembles *Rhadine myrmecodes* Horn, but the large series which has been studied shows that there are constant differences such as being a bit broader as regards both prothorax and elytra, more shining, *myrmecodes* being sub-opaque and alutaceous, with the third antennal segments more uniformly much longer than the fourth segments, the sides of prothorax almost straight and convergent behind instead of distinctly sinuate, the hind angles generally with a small everted tooth at apex, lacking in the other, the elytra with the apical sinuosity more abrupt and marked and the sutural spines less acute and shorter. Its distribution is more to the east, eastern Texas, whereas *myrmecodes* is from the regions to the west, generally Arizona. It might be considered as a subspecies, but I think that until we have more intermediate forms from intermediate territory, it is best to keep them apart.

Rhadine longiceps Van Dyke, new species

Small, narrow, with long and delicate legs and antennae, piceous, subopaque, legs and underside lighter, the palpi and antennae rufous. Head fully a third longer than broad, the frontal impressions deep and rugose, the mandibles prominent and porrect; the eyes feebly convex; the post occipital area fully as long as the head in front of eyes and with sides oblique and converging to the narrow neck; antennae long, extending to the middle of elytra, the third segment about one fourth longer than fourth. Prothorax elliptical, almost a third longer than broad, apex feebly emarginate, the apical angles rounded but not prominent, the sides broadly arcuate in front, almost straight and convergent to hind angles which are obtuse, basal margin feebly emarginate, the disc convex, smooth and shining, the median longitudinal impression distinct, the posterior transverse not well defined, the sides somewhat deplanate, the side margin broadly reflexed. Elytra elliptical, almost twice as long as broad, feebly convex, the striae very fine, feebly impressed, very finely, obscurely punctured at best, the intervals quite flat, alutaceous, the third with several foveae close to the third stria, the apices obliquely, gradually sinuate, the sutural angles divergent, short and right angled, the submarginal punctures distinct but not deeply impressed, the lateral margin broadly reflexed. The front, middle and hind tarsi with distinct median groove, the middle and hind also with lateral grooves. Length 10 mm., breadth 4 mm.

Holotype female, No. 6013, C.A.S. Ent., and two *paratype* females, collected by Dr. E. S. Ross, from beneath stones, 10 miles west of ALPINE, TEXAS, November 28, 1946.

This small, narrow and dark species is quite distinct. Its head simulates that of *longicollis* Benedict, a subterranean species from the Carlsbad caverns of New Mexico, otherwise unrelated, its prothorax is narrow and elliptical, not cordate like that of *myrmecodes* Horn and its small relatives, and its elytra are also elliptical. Its dark piceous color is also in contrast to the rufo-castaneous color of the more or less subterranean species.

CEBRIONIDAE

Cebrio pallidipennis Van Dyke, new species

Moderately elongate, depressed, parallel sided, head and pronotum, except basal margin and underside piceous; base of prothorax, elytra, antennae, mouthparts and legs testaceous, and very sparsely clothed with short and closely appressed pile. Head rather coarsely, closely punctured with a somewhat triangular

shaped pit at the center of an impression between the eyes, labrum broadly emarginate in front, eyes prominent; antennae serrate, reaching two segments beyond hind angles of prothorax, second segment small and transverse, the third small and triangular, the fourth to tenth strongly serrate. Prothorax broader than long, apex slightly arcuate, sides feebly rounded in front, the hind angles small, triangular and divergent, the disc convex and rather coarsely, densely punctured. Elytra twice as long as wide, the striae distinctly impressed and regular with the strial punctures toward the middle coarse and regularly arranged, the odd intervale quite convex, the even more flattened except at base, and finely, irregularly punctured. Beneath finely punctured and clothed with short fulvous pile with the prothoracic intercoxal process rather broad. Length 11 mm., breadth 4 mm.

Holotype, No. 6014, C.A.S. Ent. and five *paratypes* collected at TUBA CITY, ARIZONA, July 4 and 3, 1937, by R. P. Allen and kindly presented to the Academy. Besides the six specimens mentioned above there are two specimens collected at the same time and place which are entirely testaceous except the head, otherwise not different. I consider these merely color phases.

This species is eminently a desert species and its color indicates it. Because of this its appearance is entirely different from that of any other in our fauna.

BUPRESTIDAE

Acmaeodera lucia eburna Van Dyke, new subspecies

Small, short, moderately convex and compact, aeneous except hind angles of pronotum where there is a large yellow patch and the elytra which are ivory colored except for a narrow sutural line and the humeral umbone which are black, the upper surface clothed with a moderately dense, erect pale pile. Head coarsely, densely punctured, feebly longitudinally impressed at middle, antennae short, hardly reaching the middle of prothorax, the segments 5-11 serrate. Prothorax two fifths broader than long, apex feebly biemarginate, sides rather evenly arcuate from base to apex, the margin very fine, concealed behind when viewed from above by sides of pronotum; the disc quite convex, coarsely, cribrately punctured at sides, more discretely at middle, a shallow median longitudinal impression with a distinct puncture at the base, and a narrow transverse impression behind the apical margin. Elytra slightly narrower at base than prothorax, about twice as long as broad, sides very feebly sinuate in front of middle and gradually arcuate and narrowed to blunt apex; the disc quite convex, feebly flattened at middle, the humeral umbone distinct, the striae distinct at sides, feeble towards suture and rather

coarsely regularly punctured, the intervals finely punctured and rugose, the sides serrate near apex. Beneath rather coarsely, densely punctured. Prosternum very feebly, broadly emarginate in front. The last ventral segment with a small transverse lobe like plate before apex. Length 7 mm., breadth 2.5 mm.

Holotype, No. 6015, C.A.S. Ent. and numerous designated *paratypes* from a series of 32 specimens collected by myself 25 miles east of BAKER, CALIFORNIA, June 24, 1948. They were swept from the salmon colored flowers of a species of mallow, *Sphaeralcea*, probably *ambigua* Gray. Other specimens have been designated as paratypes from the collection of Mr. Burdette E. White, my companion on the trip who secured an even greater number of specimens than I did.

This subspecies is quite different in appearance from typical *lucia* Fall and the large series of specimens taken in one locality which has the elytra practically immaculate, a few specimens only having limited markings, seem to set it apart.

DRYOPIDAE (ELMINAE)

Simsonia giulianii Van Dyke, new species

Elongate, subparallel, shining, piceous, the head and pronotum aeneous, the elytra with a light yellow humeral spot generally prolonged for a short distance obliquely backwards and inwards and a yello apical vitta extending obliquely backwards and inwards from slightly behind the middle towards the suture and apex but not reaching the latter; the upper surface sparsely, finely pubescent. Head coarsely, sparsely punctured; antennae not quite reaching hind angles of prothorax. Prothorax about one seventh broader than long, apical lobe distinct, sides feebly arcuate posteriorly, almost straight and convergent forwards; the disc convex with coarse well spaced punctures; lateral margins narrow and distinct, the front and hind angles prominent. Elytra not quite twice as long as wide, sides straight in basal two thirds and feebly diverging backwards, thence broadly rounded and oblique to apex. The disc evenly convex, the striae hardly observable but the stria punctures rather coarse, regularly arranged and equal in width to the intervals, the intervals flat and with a few minute punctures. Beneath more or less rufopiceous, the antennae and tarsi entirely rufous, the prosternum coarsely punctured, anterior abdominal segments more sparsely so and abdomen as a whole alutaceous. Length 2.25 mm., breadth .75 mm.

Holotype, No. 6016, C.A.S. Ent., and numerous designated *paratypes* from a series of 88 specimens collected at RIO NIDO

on the RUSSIAN RIVER, SONOMA CO., CALIFORNIA, August 8, 1948, by D. Giuliani and kindly presented to me.

This species is rather closely related to *Simsonia brunnescens* (Fall) from Clear Lake, Lake Co., Calif. This latter is in most cases of a uniform brown color, proportionally longer, the elytral punctures coarser, generally as wide as intervals and more irregular, less parallel with the punctures in the adjacent rows. The distinctive features of *giulianii* are the color pattern, head and pronotum aeneous, and elytra piceous with basal and anal markings, sometimes united.

EROTYLIDAE

TRIPLAX ANTICA LECONTE

Recently Mr. Gordon Stace Smith of Preston, British Columbia, has submitted through Mr. Hugh Leech, a series of fifty two specimens of this long uncollected and desirable species. About a third of the specimens are more or less typical, with a black pronotum, piceous or dark head, and black elytra with rufous or fulvous base and black undersides. The remainder are atypical with the head, pronotum and base of elytra rufous and the underside of head and prothorax also rufous while the apical portion of elytra and abdomen are black. This species was first collected by Mr. George Gibbs of the Northwest Boundary Commission, at Sinyak water depot, presumably east of Fort Colville, now in the State of Washington, as all of the other specimens submitted by Mr. Gibbs were from "East of Fort Colville." Preston, British Columbia, is only a short distance northeast of Fort Colville and in the same biological territory.

CURCULIONIDAE

Panscopus remotus Van Dyke, new species

Of moderate size, robust, the upper surface clothed with small, closely applied chocolate brown scales with here and there a few lighter colored scales as on the sides of prothorax and in a vague arc extending backwards from the humeri, and in addition numerous short, recurved setae; and the undersurface likewise clothed with scales of larger size and with the gray scales in greater numbers and with a few short, inclined hairs. The head broad between the eyes, the eyes large but much flattened, the rostrum broad, feebly grooved above and about as long as prothorax; the antennae stout, the scape reaching the eyes, the funicle with the first seg-

ment about twice as long as broad, the second somewhat longer, the third barely longer than broad and the following about as long as broad or somewhat transverse, and the club fusiform. The prothorax as broad as long, coarsely rugose above, with a well impressed median longitudinal sulcus and with sides broadly rounded. The elytra twice as long as prothorax, cordiform, base feebly emarginate, the striae well defined and with coarse, well spaced punctures, the odd intervals convex, prominently elevated and with an irregular double row of short recurved setae, the even intervals flattened in front, feebly convex behind and with a single row of recurved setae. Hind tibia practically straight. Length 9 mm., breadth 4 mm.

Holotype No. 6017, C.A.S. Ent., a unique from the TAQUITZ VALLEY, SAN JACINTO MTS., CALIF., June 14, 1939, collected by Dr. E. S. Ross on lupine.

This species has the general appearance of *Panscopus abruptus* and the flattened even numbered elytral intervals, especially basally, but is otherwise more like *rugicollis* Buchanon chiefly as regards the short broad rostrum, the deeply impressed median longitudinal prontoal impression, the convex elytral intervals, the even numbered ones almost as greatly elevated as the odd numbered and all bearing rows of short recurved setae. It appears to be intermediate structurally between the two species which are also to be found much farther to the north.

NOTES ON BEMBIDION

In 1925, I described a carabid beetle as *Bembidion coeruleascens* Van Dyke. In 1928, Csiki in his catalogue substituted the name *vandykei* as the first name was preoccupied in the genus. This was unfortunate, as Dr. Blaisdell had in 1902 used the name *vandykei* for another species of *Bembidion*. To replace both *coeruluescens* Van Dyke and *vandykei* Csiki, I now propose the name *umbraticola* Van Dyke.

When I described *Bembidion utahensis* in 1925, I tentatively placed it in the genus *Lymneops* and near *laticeps* Lec. Restudying it and with more material, I now find that it belongs in the subgenus *Amerizus* of *Bembidion* and close to *oblongus* Mann. As compared with *oblongus*, the eyes of *utahensis* are much less prominent, the prothorax less narrowed behind, and the elytra less broadly elliptical.—EDWIN C. VAN DYKE.

SIX NEW MEXICAN MITES OF THE SUBFAMILY RHIZOGLYPHINAE[1]

(Acarina)

BY H. H. J. NESBITT
Ottawa, Canada

In this paper are described six new mites that Dr. F. Bonet of Mexico City collected from different parts of his country. Three of these are, in the opinion of the writer, well characterized new species; one in fact is represented by three subspecies from different localities. The other two are considered subspecies of already described species rather than new species because, the characters which distinguish them and which may be used to separate them from the latter are much less distinct and noticeable than are usually to be found between closely related species in this genus (*Caloglyphus*). Subsequent collecting and additional work, however, may show that some or all of the mites herein given the rank of subspecies are in reality either true but feebly characterized species, or geographical races of widely distributed forms.

Some explanation should be offered for the method used in arriving at the measurements given for the different parts of the body. The figure for the length of the body proper does not include the chelicerae but rather is taken from the anterior margin of the propodosoma (just anterad of the rostral setae) to the posterior margin of the opisthosoma. Similarly the figures given for the leg and tarsus do not include the claw but instead are taken from the distal end of the supporting rami of the claw to either the coxal border of the trochanter in the case of the leg or the proximal border of the tarsus when this last member is being measured. In deriving the formula for the dorsal chaetotaxy, seta 4c[2] is taken as the basal measurement because it varies very little in relative length from species to species, and the lengths of the other setae are compared either directly or indirectly to it. In the formula, setae 5 and 7 are hypothetically straightened out (if not in this position on the specimen) so that their

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[1]Contribution No. 2542 Division of Entomology, Science Service, Department of Agriculture, Ottawa, Ontario, Canada.

[2]For a reference to the names of the setae, see Nesbitt, 1945.

length can also be expressed as a fraction of the distance between their base and that of the next seta (5 to 7, and 7 to 9). Thus the tip of seta 5 either fails to reach, approximates or passes the base of seta 7 and the same can be said of seta 7 in relation to the base of seta 9. As an example—in the description of *Caloglyphus longipilus* n. sp. (vide infra), the tip of seta 5 is said to pass the base of seta 7 for better than one-half of its own length. This means that seta 5 is greater in length by one-half than the distance between its base and that of seta 7. In the female the distances between setae 5 and 7, and 7 and 9, may be altered as the opisthosoma is free of eggs, partly filled or greatly distended. Whenever possible, the measurements are given for females in the early stags of egg laying, i. e., before the opisthosoma becomes abnormally distended.

Caloglyphus longipilus Nesbitt, new species
Figs. 3, 5, 8, and 9.

Description: The males of this species are roughly ovoid in shape with the small end directed posteriorly. Exclusive of the chelicerae they average .6 mm. in length and .3 mm. in width. The non-gravid but mature females are slightly larger, generally more globular and measure .75 by .40 mm.

The dorsum bears the usual propodosomatic escutcheon, which, in this species is weakly sclerotized and bears posteriorly a slight notch. The pseudostigmatic organ is setiform and almost equal in length to seta 4c. The nuchal bristle is readily visible and as the end is rough or very faintly pectinated, it resembles an artist's worn-out paint brush. The dorsal setae are arranged in the pattern typical of the members of this genus. For simplicity of description, the relative lengths of the setae may be expressed as fractions of one of the fixed setae. Thus the chaetotactic pattern of the male is as follows: seta 3a = 2.6 x 4c; 5= 5 x 4c; 7 = 6.5 (to 7) x 4c, or 1.5 x 5; 8 = 7; 9 = 1.1 x 7 or 60% of the length of the body; 14 = 1.2 x 7. The tip of seta No. 5 passes the base of 7 for better than one-half of its own length. The tip of 7 passes the base of 9 for slightly better than one-third of its own length. On the ventral surface seta 11 = .7 x 4c and 13 = 4 x 11 (vide fig. 9).

The chaetotactic pattern of the female may be expressed as follows: seta 3a = 2 x 4c; 5 = 3 x 4c; 7 = 5 x 4c or 1.6 x 5; 8 = 7; 9 = 7 or 30% of the length of the body; 14 = 1.1 x 7. The tip of seta No. 5 just reaches the base of No. 7. The tip of seta 7 passes the base of No. 9 for one-fifth of its length. The anal setal pattern is shown in Fig. 3.

The legs of this species are, in relation to those found on kindred forms, and in relation to the size of the body, quite long and

thin. The anterior legs in the two sexes are approximately equal in length but, because of the differences in shape and size of the body, those of the male appear and are proportionately longer equalling approximately one-half of the length of the body whereas in the female they are only about one-third. The anterior tarsi in the male are equal in length to the two preceding segments whilst in the female thy are just slightly shorter. The femora of legs I and II of both sexes bear a long seta which is equal in length to the distance between its base and the base of the macrosense seta of the tarsus. The sensory setae at the base of the tarsus I are shown in Fig. 8. The posterior legs in both sexes are equal to approximately one-half of the length of the body (in some females they are slightly shorter) and their tarsi are slightly longer than the combined length of the two preceding segments. Tarsus III of the male bears laterally one decided spine and a second structure which is more setiform than spiniform.[3] The suckers on tarsus IV of the male are located in the distal half of the segment and the proximal sucker is on much the same level as the proximal spine. Distally all the tarsi bear falcate setae. There are three such setae on each of tarsi I and II, two on tarsus III, and one on tarsus IV of the male and possibly two on tarsus IV of the female. The paddles on seta 5 of tarsi I and II and those on the terminal setae of tarsi III and IV are frequently so narrow that they can only be seen with difficulty.

The penis (vide Fig. 5) in this species is short and blunt and its tip curves ventrally. The supporting rami enclose an equilateral triangle.

Notes: The species described above resembled Oudeman's *Caloglyphus brasiliensis*[4] in many major details but differs in several small but important characteristics. When these differences coupled with the totally different types of habits, para rubber (source unknown) and rotting wheat (from Bismark, Germany) as opposed to bat guano (from Mexican caves), are taken into consideration, I believe the establishment of a new species is warranted.

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[3]In some species, e.g. *C. anomalus* Nes., this seta is definitely setiform and found in the distal feminine position; in others such as *C. berlesei* (Mich.), it is beside the fixed lateral seta and assumes the spiniform shape. The species under consideration is similar to *C. terminalis* (Banks) in that this seta is intermediate in form.

[4]As the original description of *C. brasiliensis* Oudemans (1924, Ent. Ber. 6 (140): 318) is not sufficiently detailed to be used in comparative work, I have based my knowledge of this species on 1) a study of two of Oudeman's slides labelled "*Caloglyphus brasiliensis* Oudms. 1924 ♀ dors. vent. in Sauerfutter Bismark (Sachsen) 10.10.1926 Dr. F. Zacher 3639" and ditto, "♂ dors. vent. 3639." 2) A study of Oudeman's drawings of this species, Nos. 1274-1278 inclusive. Both the slides and the drawings are now deposited in the Rijksmuseum van Natuurlijke Historie, Leiden, and it was through the kind offices of Prof. H. Boschma of the University of Leiden to whom I offer my grateful thanks, that I was able to see them.

This species may be differentiated from *brasiliensis* by the following characteristics. 1) The cleft in the propodosomatic escutcheon in the latter species extends anteriorly for almost one-half the length of the plate—in the new form it is not much more than a mild indenture. 2) In Oudemans' species, seta 9 in the female is truncate as it is in *berlesei* whereas in the new species, this seta is as long as any of the posterior setae (12 or 14). 3) In the male of *brasiliensis*, the supporting rami of the penis are heavily shouldered and the two median setae of tarsus III are spiniform; in *longipilus* the rami are without shoulders with the result that the whole genital structure resembles an equilateral triangle and tarsus III has one spiniform and one setiform seta.

The females of this species may be separated readily from those of *C. terminalis* and *C. berlesei*, the two other closely related forms, on the basis of the length of certain of the setae. In the new form, setae 5 and 7 are relatively longer than in either of the aforementioned species. In them, the tip of seta 5 misses the base of 7 for a distance approximately equal to its own length and seta 7 either misses the base of 9 for a distance equal to one-fifth of its own length or just approximates it. In the new species, on the other hand, the tip of 5 reaches as far as the base of 7 and the tip of 7 exceeds the base of 9 for a distance equal to one-fifth of its own length. Furthermore, in *C. berlesei* and frequently in *C. tarsalis*, seta 9 is short and truncate whilst in the species under discussion it is long and whip-like. Certain of the ventral setae such as the inner para-anals are shorter in this species than they are in either *C. terminalis* or *C. berlesei*. In addition to this, seta 3 of the inner row is definitely behind seta 3 of the outer row whereas in the other mentioned species, these two setae are on much the same level.

The males may be readily separated from those of *berlesei* and *tarsalis* on the shape of the penis and the relatively greater length of the dorsal setae. In both *berlesei* and *tarsalis* the penis is straight, long, and tapering whereas in the species under discussion it is short, blunt, and bent ventrally.

Type Habitat: Bat guano, Caves, Mexico.

Holotype: ♂. CUEVA DE JUXTLAHUACA, GUERRERO. January 16, 1941. (Dr. F. Bonet). No. 5764 in the Canadian National Collection, Ottawa. *Allotype:* ♀, same date. *Paratypes:* In the Canadian National Collection: 1♂, 1♀, Cueva de Jaxtlahuaca, Guerrero, 16-1-41 (F. Bonet). In the United States National Museum,

Washington: 3♂♂, 3♀♀, Gruta del Carrizae. Nuevo Leon, 16-6-42 (F. Bonet). In the Collection of Dr. F. Bonet, Mexico City, Mexico: 3♀♀, Gruta del Carrizae, Nuevo Leon, 16-6-42 (F. Bonet) (note slide also includes a ♂ of another species); 1♂ and 1♀ (2 slides) 7♀♀, Cueva de Juxtlahuaca, Guerreo, 16-1-41 (F. Bonet).

Caloglyphus paranomalus Nesbitt, new species
Fig. 2

Description: The males of this species are ovoid in shape with the small end directed anteriorly. Exclusive of the chelicerae they measure .59 mm. in length and .36 mm. in width. The mature but non-gravid females are still more globular in shape measuring .76 mm. in length by .43 mm. in width. In gravid females the opisthosoma frequently becomes so distended with eggs that the posterior margin bulges out on either side of the opening to the bursa copulatrix giving the body a characteristic shape which is reminiscent of an inverted but conventional heart.

The dorsum bears a weakly sclerotized propodosomatic escutcheon which is difficult to see; a small peg-like pseudostigmatic organ; and the usual setae which are arranged in the following chaetotactic pattern in the male; seta 3a = 1.5 x 4c; 5 = 1.5 x 4c; 7 = 5 x 4c or 4 x 5; 8 = .9 x 7; 9 = 7 or 30% of the length of the body; 14 = 7. The tip of seta 5 misses the base of 7 for a distance slightly greater than its own length. The tip of 7 just reaches the base of 9.

The chaetotactic pattern of the female may be expressed as follows: seta 3a = 1.5 x 4c; 5 = 2 x 4c; 7 = 8 x 4c or 3.5 x 5; 8 = .8 x 7; 9 = .8 x 7 or 28% of the length of the body; 14 = .9 x 7. The tip of seta 5 misses the base of 7 for a distance equal to its own length. The tip of 7 just reaches the base of 9.

The legs of this species are of moderate length for a caloglyphid. In the male they are equal to almost one-third of the length of the body; the anterior and posterior pairs are of approximately equal length with this exception that the fourth pair are about one-seventh longer than the others; and the tarsi of all are just slightly shorter than the combined length of the two preceding joints. In the female the legs bear the same relationship to each other and to the length of body; their anterior tarsi are equal in length to, and the posterior longer than, the combined length of the two preceding segments. The macrosense seta of tarsus I in both sexes is mildly clavate and equal to five-sixths of the width of the tarsus at its narrowest part; the other two sensory setae at the base of this joint are respectively slightly longer and about one-half as long as the macrosense seta. Tarsus III of the male bears only one lateral spine and three terminal setae. The suckers on tarsus IV

of the same sex are in the distal half of the segment, the proximal sucker, however, is more proximal in position than in the closely related *C. anomalus* Nesbitt.

The penis is short, truncate and heavily sclerotized. Its tip is spout-like, open on the dorsal surface and bent ventrally. The supporting rami are also heavily sclerotized.

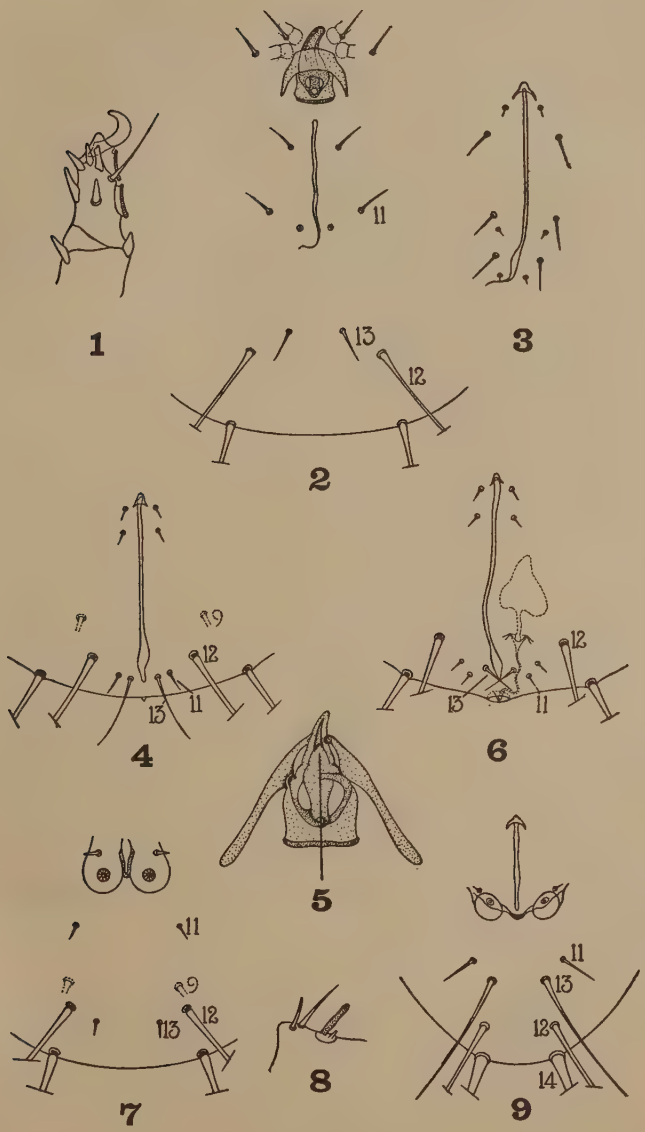
No hypopi or heteromorphic males have been seen.

Notes: This mite was found in considerable numbers in two different samples of bat guano from Mexico. It closely resembles *C. anomalus* Nesbitt[5] in all major respects but differs from it in such details as size, the relative proportions of certain of the dorsal setae and habitat preference, e. g., in *C. anomalus* the males measure .84 to .94 mm. in length; the females .84 to .98 mm; the integument is heavy, the legs are brown and the propodosomatic escutcheon and areas about the coxae are sclerotized. In the new species, on the contrary, the body is smaller (vide supra), the integument is light, like the legs whitish in colour, and the propodosomatic escutcheon can only be seen with difficulty. The articulation areas about the coxae are not visibly sclerotized. Other differences pertain to the length of certain of the dorsal setae. In *anomalus* the tip of seta 7 misses the base of 9 for a distance almost equal to its own length and seta 9 is equal to 20% of the length of the body in both sexes. In the new species the tip of 7 just reaches the base of 9 and this latter seta is equal to 30% of the length of the body. Furthermore, the eggs in the new species are relatively larger being equal to 22% of the body length whereas in the former species, they are equal to 14% of this length.

[5] *Vide* Can. Ent. 76(2): 21-24, 1944.

EXPLANATION OF FIGURES

1. Tarsus IV ♂—*Rhizoglyphus mexicanus mexicanus* Nesbitt. 2. Anue and Penis, *Caloglyphus paranomalus* Nesbitt. 3. Anus ♀, *Caloglyphus longipilus* Nesbitt. 4. Anus ♀, *Rhizoglyphus mexicanus mexicanus* Nesbitt. 5. Penis, *Caloglyphus longipilus* Nesbitt (dorsal right side, ventral left). 6. Anus ♀, *Rhizoglyphus mexicanus major* Nesbitt (bursa copulatrix and apparatus dotted in). 7. Postanal area ♂, *Rhizoglyphus mexicanus mexicanus* Nesbitt. 8. Basal setae Tarsus I, *Caloglyphus longipilus* Nesbitt. 9. Postanal area ♂, *Caloglyphus longipilus* Nesbitt.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Such differences in themselves may not be great enough to warrant the erection of a new species but as fairly large populations of both have been found, and as there is no evidence of intergradation in the characters mentioned, I believe that we are justified in following such a course especially when the differences in habitat, rotting lillies as opposed to bat guano, are taken into consideration. A close comparison of these two species suggests that they were derived from a common ancestor which underwent a mutation resulting in the loss of the anal copulatory suckers. The break-away from the true Caloglyphid stalk must have been at a rather recent date because all the other Caloglyphid features are present and, unlike certain non-acarids (non-tyroglyphids) who have lost all trace of the copulatory suckers, or who never had them, these two forms have retained the three pairs of setae which are normally located on or behind the suckers as well as the minute pore from the centre of the sucker (vide fig. 2 which may be compared with fig. 7 or 9). To draw attention to the close relationship which evidently exists between this species and *anomalus*, it has been given the specific name *paranomalus*.

Type Habitat: Bat guano, Caves, Mexico.

Holotype: ♂, CUEVA DE LAS CALERAS. C. HIDALGO, May 7, 1941. (Dr. F. Bonet); No. 5765 in the Canadian National Collection, Ottawa. *Allotype:* ♀, same data. *Paratypes:* In the Canadian National Collection: 2♀♀ allotype slide; 1 immature ♂, Gruta de Atoyac, Atoyac, Ver. Mexico, 30-5-41, (F. Bonet); 1♂, 2 immature ♂♂, Gruta del Carrizal, Nuevo Leon, 16-7-42, (F. Bonet). In the United States National Museum, Washington: 2♂♂, 1♀, Cueva de las Caleras, C. Hidalgo, 7-5-41 (F. Bonet). In the collection of Dr. F. Bonet, Mexico City, Mexico; 2♂♂, 1 immature ♂, 3♀♀, Cueva de las Caleras, C. Hidalgo, 7-5-41 (F. Bonet); 1 immature ♂, Gruta de Atoyac, Atoyac, Ver. Mexico, 30-5-41 (F. Bonet); 1♂, 2 immature ♂♂, Gruta del Carrizal, Nuevo Leon, 16-7-42 (F. Bonet).

In addition to the types and partypes listed above the description of this species is based on some thirty other specimens, (from the same habitats) which are not listed because they are either imperfect specimens or on slides with other closely related species.

Caloglyphus armipes longisetosus Nesbitt, new subspecies

Description: Exclusive of the chelicerae, the males of this species measure from .53 to .6 mm. in length, the females .66 to .78 mm and the heteromorphic males .55 to .60 mm. The propodosomatic escutcheon, the lateral flanks of the propodosoma and the areas about the articulation of the first two pairs of coxae are weakly sclerotized. The pseudostigmatic organ is a tiny peg reminiscent of that found in *C. spinitarsus* (Herm.). The nucal bristle is bifurcate at the tip and relatively inconspicuous. The chaetotactic pattern of the dorsal setae of the male may be expressed as follows: seta 3a = 1.1 x 4c; 5 = 5.5 x 4c; 7 = 7 x 4c or 1.2 x 5; 8 = .7 x 7; 9 = 1.2 x 7 or 68% of the length of the body; 14 = 1.4 x 7. The tip of seta 5 passes the base of 7 for approximately two-thirds of its own length. The tip of 7 passes the base of 9 for almost 40% of its own length. The chaetotactic pattern of the heteromorphic male is as follows: set 3a[6] = 1.1 x 4c; 5 = 3.8 x 4c; 7 = 4.4 x 4c or 1.1 x 5; 8 = .7 x 7; 9 = 1.1 x 7 or 80% of the length of the body; 14 = 1.3 x 7. The tip of seta 5 passes the base of 7 for 75% of its own length. The tip of 7 passes the base of 9 for 60% of its own length.

The chaetotactic pattern of the female is as follows: seta 3a = 1.1 x 4c; 5 = 2.8 x 4c; 7 = 4.8 x 4c or 1.7 x 5; 8 = 7; 9 = 7 or 25% of the length of the body; 14 = 1.2 x 7. The tip of 5 just reaches the base of 7. The tip of 7 just reaches the base of 9. (In gravid ♀♀, the tip of 7 misses the base of 9 for a distance which is dependent on the number of eggs in the particular female being investigated). The anus in the ♀ is flanked by two rows of setae on each side, those of the outer row are as long as seta 4c; those of the inner row are only about one-fifth as long.

The legs of this species are relatively long. The two anterior pairs are equal to 30% of the length of the body in the ♀, 47% in the normal male and 60% in the heteromorphic male. The posterior pair are equal to 37% in the ♀, and 64% in the normal male. In the hetehomorphic male, the third leg is short whilst the fourth is equal to 77% of the length of the body. In the three forms (normal and heteromorphic, males and females) the anterior tarsi are equal in length to the two preceding joints whilst the posterior tarsi are longer than the combined length of genu and tibia.

Notes: These specimens resemble *Caloglyphus armipes* Banks very closely but differ in such details as size, the relative proportions of certain setae, and the type habitat in which they are found. Since, as was mentioned in the introduction, such differences are not as great as usually are found between well established species in this genus I am of the opinion that the new form, to which the name *longisetosus* has been given is either a feebly

[6]Seta 4c is a different length in the three forms. It is shortest in the ♀, longer in the normal ♂, and longest in the heteromorphic ♂. This relationship may be expressed by stating that seta 4c is 1 unit long in the ♀, 1.5 units long in the ♂, and 2.6 units long in the heteromorphic ♂.

characterized species or a subspecies of *Caloglyphus armipes*. Until more is known about this mite, I believe that we are justified in following the latter course. In time it may prove to be a geographical race of *Caloglyphus armipes*.

The representatives of this variety are 40% smaller than typical *C. armipes*. In the males the terminal portion of seta 7 extends well beyond the posterior margin of the opisthosoma whereas in the latter mentioned form, this seta just passes the margin of the body. In the female setae 5 and 7 extend respectively as far as the bases of 7 and 9. In *armipes* s. str., on the other hand, these setae miss the bases of 7 and 9 for distances almost as great as their own length. (The reader's attention is drawn to the fact that these proportions may be altered as fewer or more eggs are contained in the opisthosoma). In the latter, the macrosense, parasubbasal, and subbasal setae are all within a third to a half of being the same length: in the variety *longisetosus*, the parasubbasal seta is one-third to one-half longer than the macrosense seta and better than twice as long as the parasubbasal seta which in turn is only about three-quarters of the length of the macrosense seta. Finally, the type specimens of *C. armipes* were taken from a dead corn pyralid. Other specimens have been taken from various types of rotting organic debris and the hypopial stage has frequently been found on the adults of *Phyllophaga* species whilst the new variety, on the contrary, has only been found on bat guano.

Type Habitat: Bat guano. Cueva de las Caleras, C., Hidalgo, Michoacan, Mexico.

Holotype: ♂, CUEVA DE LAS CALERAS, C., HIDALGO, MICHOACAN, May 7, 1941. (F. Bonet); No. 5766 in the Canadian National Collection, Ottawa. *Morphotype:* Heteromorphic ♂, same data. *Allotype:* ♀, same data. *Paratypes:* 3♂♂, 3♀♀ Canadian Collection, Ottawa, same data. 1♂, 4♀♀ United States National Museum, same data. 5♂♂, 3♀♀, collection of Dr. F. Bonet, Mexico City, same data. Twelve additional specimens, not listed as paratypes for the reasons given above were used in compiling this description.

Rhizoglyphus mexicanus Nesbitt, new species
Figs. 1, 4, 7.

This species was taken from widely separated localities and is represented in the Mexican fauna by three subspecies. Morpho-

logically these are almost identical and can only be separated by such characters in the female as a) the length of the postanal setae; b) the degree of sclerotization of the propodosomatic escutcheon and the areas about the anterior coxae; c) the relative proportions of the legs; and d) the over-all size of the animal. Apart from the degree of sclerotization which is valuable, the males cannot readily be separated. In taxonomic position this mite stands close to *Rhizoglyphus columbianus* Oud. from which it differs in the nature of the psuedostigmatic organ. In the last named species this organ is a tiny peg; in the new species and its varieties, it is a very slightly pectinated setiform structure. Furthermore, the complete lack of inner propodosomatic setae (except in 2 specimens whert they are extremely minute) and especially the peculiar arrangement of the post-anal setae in the male (vide fig. 7) separate this species from all other representatives of the genus *Rhizoglyphus* known to the writer.

Rhizoglyphus mexicanus mexicanus Nesbitt, new subspecies

Disregarding the anteriorly projecting conical chelicerae the body of this mite is roughly globular in shape. The males average .455 mm. in length (the figure does not include the gnathosoma) and .304 mm in width; the females .523 by .341 (vide Table I for a comparison of the three varieties).

The propodosoma bears the usual dorsal shield which in the case of this variety is weakly sclerotized and has an undulating posterior margin. The pseudostigmatic organ is setiform and almost as long as seta 4c. The nuchal bristle is slightly bifurcate and curved in such a manner that it hooks under the gnathosoma. The dorsal chaetotactic pattern of the male is as follows: seta 3a is absent; 5 = 2.3 x 4c; 7 = 3.3 x 4c or 1.5 x 5; 8 = 1.1 x 7; 9 = 1.5 x 7 or 32% of the length of the body; 14 = 1.6 x 7. The tip of seta 5 misses the base of 7 for a distance equal to approximately one-half of its own length. The tip of 7 misses the base of 9 for a distance equal to almost one-half of its own length. On the ventral surface, seta 11 is one-half as long as 4c and seta 13 is still shorter (vide fig. 7).

The dorsal chaetotactic pattern of the ♀ may be expressed as follows: seta 3a is missing in all but two specimens where it is only .3 microns long; seta 5 = 2.1 x 4c, 7 = 3.3 x 4c or 1.6 x 5; 8 = 7; 9 = 1.4 x 7; 14 = 1.4 x 7. The tip of 5 misses the base of 7 for a distance equal to two-thirds of its own length. The tip of set 7 misses the base of 9 for a distance slightly greater than one-quarter of its own length. On the ventral surface seta 11 is very short whilst 13 is slightly longer than 4c. Only the anterior two

pairs of anal setae are visible; the posterior have disappeared completely (vide fig. 4), (i. e., no setae pits can be found).

As can be seen from Table I, the legs are of approximately the same length in the two sexes but when compared with the length of the body, those of the male are on the whole about 4% longer than the corresponding members in the female. Tarsi I, II, and IV of the female and II and III of the male are approximately equal in length to, or just shorter than the combined length of the two preceding joints. Tarsus III in the female is greater and tarsi I and IV of the male are less than this length. Tarsus I of the female is about twice as long as it is wide; in the male it is slightly less.

The penis is straight, mildly sclerotized and truncate anteriorly. It is enclosed in and supported by two rami which together with it form an equilateral triangle. The complete ring of chitin which is usually to be found in the centre of the copulatory suckers of most rhizoglyphid and caloglyphid mites is here replaced by a rosette of chitin (vide fig. 7), which is smaller but similar to that on *Rhizoglyphus columbianus* Oud. Furthermore, the usual slender seta in the antero-lateral corner of the sucker is replaced in this species by a minute spine.

Type Habitat: Leaf mould, Mexico.

Holotype: ♀, APATZINGAN, MICHOACAN, April 2, 1943, (Col. M. Cardenas et M. Correa—submitted Dr. F. Bonet); No. 5767 in the Canadian National Collection, Ottawa. *Allotype:* ♂, same data. *Paratypes:* In the Canadian National Collection; 1♂ holotype slide, 1♀ (immature) allotype slide. In the United States National Museum 3♀♀ (2 gravid) 1♂ of same data. In the collection of Dr. F. Bonet, Mexico City, Mexico. 4♀♀ (2 gravid) 1♂, same data. 1♀, Potrero Grande, Co Jan. 15, 1943, (F. Bonet).

Rhizoglyphus mexicanus major Nesbitt, new subspecies

Fig. 6.

The general description given above for *mexicanus* is applicable to this subspecies with the following exceptions. a) The subspecies *major* is about 10% larger on the average; b) the dorsal proporosomatic shield and the lateral flanks, immediately dorsad of and adjacent to the articulation areas about two anterior coxae are sufficiently sclerotized to appear brownish in cleared specimens. c) Similar sclerotized areas may be seen on the ventral surface of the body above the epimerae. In the subspecies *mexicanus* the propodosomatic shield is so mildly sclerotized that it is only yellowish in cleared specimens and the para-articulation areas of the anterior coxae and the integument above the epimerae are not

sclerotized. d) the legs of *major* are, on the average, slightly longer, more heavily built and densely pigmented. e) In *mexicanus* (vide fig. 4), seta 13 extends well beyond the end of the opisthosoma and the two posterior anal setae are missing. In *major* (vide 6), on the other hand, the tip of seta 13 just reaches the posterior margin of the opisthosoma and one of the anal setae is present.

Type Habitat: Leaf mould, Mexico.

Holotype: ♀, PAPALOAPAN, OAXACA, February 12, 1940, (Col. F. Bonet) deposited in the collection of Dr. F. Bonet, Mexico City, Mexico. *Allotype:* ♂, same data, No. 5768 in the Canadian

TABLE I – Showing the Proportions Found in the Three Subspecies of Rhizoglyphus mexicanus Nesbitt, n.sp.

	mexicanus ♂♂		mexicanus ♀♀		major ♀♀		minor ♀♀	
	Average	Low – High	Average	Low – High	Average	Low – High	Average	Low – High
Length	455	391 – 536	523	464 – 580	613	609 – 696	473	464 – 478
Width	304	281 – 362	341	290 – 377	416	406 – 478	319	290 – 362
Leg I	155	138 – 174	157	145 – 174	168	158 – 188	130	116 – 159
II	157	145 – 181	160	145 – 174	171	157 – 185	130	116 – 152
III	145	130 – 174	139	130 – 145	143	130 – 159	109	87 – 130
IV	153	145 – 188	157	138 – 181	165	160 – 190	120	101 – 153
Seta 4c	29	23 – 33	35	33 – 39	38	33 – 49	25	23 – 29
5	58	43 – 76	66	49 – 76	64	50 – 80	35	33 – 39
7	97	86 – 109	107	92 – 115	108	99 – 125	70	73 – 82
8	104	86 – 122	103	99 – 105	113	99 – 132	78	73 – 86
9	148	139 – 172	140	132 – 148	143	132 – 158	98	89 – 115
14	151	139 – 181	147	135 – 165	145	132 – 158	108	99 – 125

National Collection, Ottawa. *Paratypes:* In the Canadian National Collection; 1♀ on allotype slide; 1♀ from rotten herbs, Fortin, Ver., Mexico, Jan. 16, 1940 (Col. F. Bonet). In the United States National Museum: 1♀ from rhizomes (host plant not stated), Mexico, D. F., Mexico, July 28-30, 1939, (Col. F. Bonet). In the Collection of Dr. F. Bonet, Mexico City, Mexico. 2♀♀ holotype slide; 1♀ from rhizomes, Mexico, D. F., Mexico, July 28-30, 1939 (Col. F. Bonet).

Rhizoglyphus mexicanus minor Nesbitt, new subspecies

This subspecies is noticeably smaller than either of the above two mentioned forms; the legs are proportionately shorter, more heavily sclerotized and on most of the specimens more deeply pigmented. Its close affinity with the subspecies *major* is established

by a) the possession of the *"major"* type of post-anal chaetotactic pattern in the female, and b) the presence of sclerotized areas above the coxae and a well sclerotized propodosomatic escutcheon.

Type Habitat: Leaf mould, Mexico.

Holotype: ♀, ORIZABA, VERACRUZ, January 14, 1942. (Col. F. Bonet); deposited in the Collection of Dr. F. Bonet, Mexico City, Mexico. *Allotype:* ♂, same data No. 5769 in the Canadian National Collection, Ottawa. *Paratypes:* In the Canadian National Collection, 1♀ allotype slide. In the Collection of Dr. F. Bonet, Mexico City, Mexico, 1♀ holotype slide, 1♀, 2♂♂ same data (Bonet).

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IDENTIFICATION OF CERCERIS CLYPEATA DAHLBOM

The correct identification of this species was reported as being in doubt by the author in 1942 (Pan-Pacific Ent. 18:189) due to his inability to get material compared with the type at Lund, Sweden. This situation has now been clarified through the kindness of Dr. Kjell Ander of the Universitetets Zoologiska Institution who has been kind enough to compare specimens with the type. In a letter under date of Nov. 12, 1948, Dr. Ander states: "The result of my examination is that *clypeata* Dahlbom *sensu* Dahlbom is=*clypeata* Dahlbom *auct. amer.*"—H. A. SCULLEN, *Oregon State College.*

THE GENUS OXYNA IN THE NEARCTIC REGION NORTH OF MEXICO

(Diptera: Tephritidae)

BY BENSON F. QUISENBERRY

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The genus *Oxyna* R.-D. has not previously been recorded from the Nearctic region though evidence has shown that Marston Bates had associated with this genus one of the species included herein.[1] The recent opportunity of the writer to examine two Palaearctic species of *Oxyna*,[2] one of which was the genotype, has prompted this paper in which two previously described species and one described as new to science are assigned to this genus.

Oxyna Robineau-Desvoidy

Oxyna Robineau-Desvoidy, 1830, Mem. Acad. Sci. Inst., France 2: 755.

Generic characters—Head (Fig. 1, A): Higher than long, wider than high, width of front across median ocellus slightly wider than maximum width of eye and slightly more than half maximum head width; cheeks broad, over half maximum eye height. Frontale bare. Antennae rather short, not extending to anterior oral margin. Frons flattened or sometimes slightly elevated along median longitudinal area. Face rather long, being as long as or slightly longer than frons, with well developed antennal fovae. Oral opening large, straight on lateral margins, curved upward abruptly at anterior margin, projecting forward. Palpi very broad and long, projecting conspicuously beyond anterior oral margin. Proboscis very slender and elongate, the labella as long as or slightly shorter than maximum head length and much longer than maximum length of oral opening. One pair lower frontoorbitals; two pair upper frontoorbitals, the posterior pair weak, pale; one pair strong ocellars; one pair strong inner verticals; one pair pale, weak outer verticals which are about the length of postverticals and but little longer than the post-ocular cilia; one pair pale postverticals; postocular cilia moderately stout, pale, interspersed with fine, dark setae; genal well developed, pale.

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[1]Specimens received from the American Museum of Natural History and here described as *utahensis* n. sp. bore Bates determination label, "*Oxyna aterrima* Doane."

[2]Dr. E. M. Hering kindly presented the author with specimens of two species of *Oxyna*, *flavipennis* (Loew), and *nebulosa* (Wied.).

Thorax: Three pairs dorsocentrals, one pair anterior to transverse suture and about in a transverse line with the presuturals, the second pair well behind suture but ahead of a transverse line through supraalars, posterior pair about midway between supraalars and intraalars; one pair presuturals; one pair humerals; one pair supraalars; one pair postalars; one pair intraalars; two pairs marginal scutellars, one near apex, one near base; two pairs notopleurals, posterior pair rather weak, pale; one pair mesopleurals; one pair sternopleurals; one pair pteropleurals. Scutellum flattened above.

Legs: Fore femora with a row of long setae ventrally and scattered ones posterodorsally; middle tibiae with one strong apical spur; hind femora with one subapical, anterodorsal seta.

Wings (Fig. 1, B): Basic pattern of brown, with milky white and yellowish spots intermixed. Apex of first longitudinal vein not extending to center of wing (slightly behind), the vein setose along its entire length from humeral vein to apex. Two costal spines. Junction of veins two and three well behind apex of second basal cell and about in line with apex of anal cell; third vein bare or with a few short setae on underside near base. Lower apical angle of anal cell drawn out to a very short and inconspicuous point on sixth vein.

Abdomen: Broader and longer than thorax. Ovipositor sheath rounded dorsally, more flattened ventrally, tapering to a rather broad apex. Male genitalia rather small, the ventrally directed claspers rounded, tapering towards their apex; inner process with two pair of small subapical teeth.

Genotype: *Trypeta flavipennis* Loew.

The Nearctic species that are here assigned to *Oxyna* agree very closely in structure with the genotype but disagree by having only two pairs of dorsocentrals, the presutural pair being absent (this character was also found to be present in the Palaearctic species, *nebulosa* (Weid.), and in the much longer whitish setae in the parafrontal region. In wing form *aterrima* and *utahensis* are typical of the genus, but that of *palpalis* is somewhat narrower and more flattened on anterior margin.

Key to the Species

1. Wing with two broad brown bands one of which originates at the humeral crossvein and extends broadly along the costa to slightly beyond apex of stigma where it turns posteriorly crossing over both crossveins to wing margin, the other fills the wing apex from points slightly behind apices of second and fourth longitudinal veins; scutellum very pale yellow, nearly white ..... *palpalis*

– Wing without bands as above; scutellum dark yellow or brown 2

2. Femora black except narrowly at apices.....*utahensis*
– Femora yellowish except for a dark spot or stripe on the underside of hind pair .....*aterrima*

OXYNA ATERRIMA (Doane), n. comb.

Eurosta aterrima Doane, 1899, Jour. N. Y. Ent. Soc. 7 (2): 187. Pl. 4, fig. 2.

The original description was based on a single female from Colorado and the following additional notes are also based on one specimen of the same sex taken by Dr. J. M. Aldrich in Platte Canyon (North of Idlewild), Colorado, June 10, 1927. Dr. M. T. James compared this specimen with the type and could find no significant deviation in structure or coloration, however, the comparison did reveal that the body of the type is greased thus obscuring the pollen.

The statement by Doane that the palpi and proboscis are short is misleading, they are typical of the genus though not as pronounced in comparative size as in the genotype. Third antennal segment rounded on lower anterior corner but subacute on upper one. Occiput with a black spot just above the neck that emits a short ray on either side to outer vertical bristles. Thorax with yellowish and cinereous pollen intermixed with the latter restricted mainly to the lower half of pleura, metanotum, and lower half of postnotum. Scutellum with faint brownish markings around lateral bristles. Wings (Fig. 1, C). Abdomen black in ground color but densely cinereous and brownish pollinose, the latter tending to form a pair of large spots on each tergite. Ovipositor sheath 0.53 mm. long.[3]

Type in the Collection at the State College of Washington.
Distribution: Colorado.
Host plant: Unknown.

Oxyna utahensis Quisenberry, new species

Close to *aterrima* but easily distinguished from that species by the brown marks on the mesonotum and by the black femora

Male and female—Head: Mainly whitish; frontale and vertex yellow to brownish yellow; ocellar triangle and upper half of occiput black. Some of the whitish setae on parafrontals nearly as long as lower frontoorbitals. First and second antennal segments pale yellow, former with pale setae, latter with brown; third yellow or brownish yellow, about as long as broad, apex rounded or

[3]All ovipositor sheath measurements in this study were made from the dorsal side.

the upper anterior corner subacute, variable; arista dark brown. Proboscis brownish yellow, palpi pale yellow, tips darker, with short brown setae.

Thorax: Mesonotum 0.95-1.43 mm. long. Ground color black except for humeri and upper half of postnotum which are yellowish (notopleura sometimes yellow in greasy specimens). Cinereous pollinose except for following brownish areas: large spot on mesopleura; a pair of vittae on notum that extend from anterior margin to scutellum, or to a point about midway between the two pair of dorsocentrals, or these may be obscured by grayish pollen and appear only as elongate spots at anterior dorsocentral bristle; an inconspicuous spot at base of presutural bristles, this spot sometimes emitting an inconspicuous stripe posteriorly; and scutellum. The yellowish areas and brown color of scutellum is often obscured by cinereous pollen. The short setae are whitish, and longer and more dense on pleura. Bristles black except for whitish posterior notopleural and pteropleural.

Legs: Femora black except at apices, the dark area cinereous pollinose; remainder of legs yellow. The setae mainly whitish but with some pale yellow and brownish intermixed.

Wings (Fig. 1, E): Length 2.80 mm long. Much the same as in *aterrima* except there is no small whitish spot on costa midway between humeral vein and apex of auxiliary vein, the whitish spots tend to be larger and more confluent, and there is less brown in axillary region.

Abdomen: Shining. Tergum mainly brownish pollinose but with cinereous as follows: a narrow, inconspicuous, central stripe; lateral margins; and a narrow band on hind margins of tergites, that on apical tergite may in some cases be yellowish. Venter mainly brown, cinereous pollinose, with or without yellow on hind margins of sternites, variable. The setae are whitish, and longest on hind margin of apical tergite. Male genitalia dark brown, with fine pale pubescence. Ovipositor sheath 0.59 mm. long, shining black, with very fine reddish pubescence.

Types: *Holotype* male, *allotype* female, TEMPLE FORK, LOGAN CANYON, UTAH, April 25, 1934 (T. O. Thatcher); *paratypes*, one female and two males, Blacksmith Fork Canyon, Utah, June 4, 1935 (T. Thatcher), one male, Green Canyon, Utah, June 1, 1935 (G. F. Knowlton), one male, Logan Canyon, Utah, May 29, 1933 (G. F. Knowlton and E. W. Anthon) and one male, same date, but May 16, 1934 (T. O. Thatcher), in the American Museum of Natural History. Paratypes, two males, Lind, Washington, May 15, 1922 (M. C. Lane), in the United States National Museum.

Host plant: Unknown.

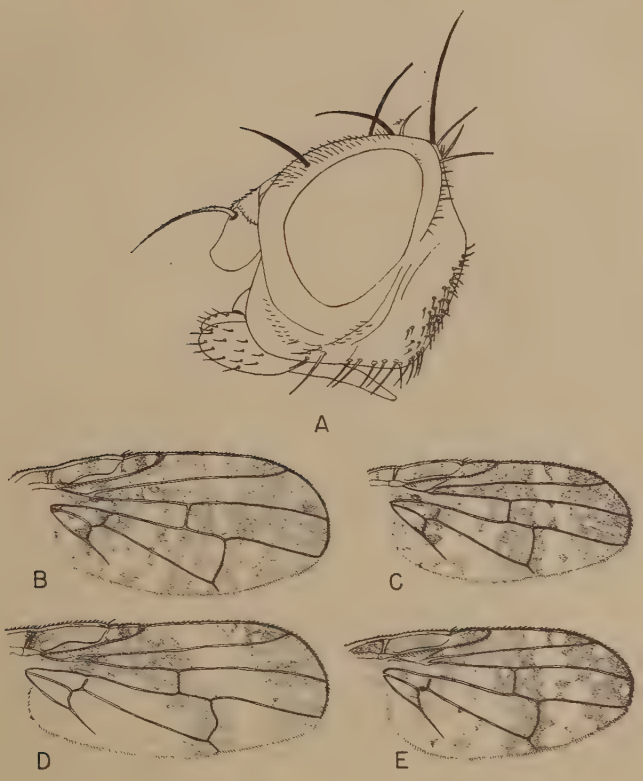

Fig. 1—A. Head of *O. flavipennis* (Loew), lateral view; B. wing of *O. flavipennis* (Loew); C. wing of *O. aterrima* (Doane); D. wing of *O. palpalis* (Coquillett); E. wing of *O. utahensis* Quisenberry.

OXYNA PALPALIS (Coquillett), n. comb.

Tephritis palpalis Coquillett, 1904, Invertebrata Pacifica. 1:30.

This species is easily distinguished from *aterrima* or *utahensis* by the distinctive wing pattern. The following additional notes include characters of the female which had not previously been described, the original description of the species being based on a single male specimen from Ormsby County, Nevada.

There are two or three pair of weak, whitish setae along the parafrontal area which are nearly the length of the lower frontoorbitals. Thorax grayish pollinose except for some brownish on notum. Humeri, sometimes the area immediately below to anterior coxae, and sometimes the notopleural area, and wing base yellowish. Pteropleural and posterior notopleural bristles whitish. Scutellum wholly pale yellow, nearly white. Wings (Fig. 1, D) 2.80-4.20 mm. long; the yellowish spots in the stigma may be only faintly discernable; the apical brown band may extend rather far back on anterior costal margin so as to nearly touch the basal band. Dorsum of abdomen with some light brownish pollen intermixed with the cinereous; venter yellow, with cinereous and yellowish pollen, the former sometimes obscuring yellowish color; pleura yellowish. Ovipositor sheath 0.59-0.84 mm. long, pale amber or yellowish brown in color, bare except for some very fine scattered hairs. Grayish pollen sometimes obscures the pale yellowish color of male genitalia.

Type in the United States National Museum.

Distribution: Nevada, California and Idaho.

Host plant: Unknown.

Material examined included two females and one male, no data, from the American Museum of Natural History; one male, Yellowstone (Roosevelt Lodge), California, July 1, 1938 (E. C. Van Dyke), from the California Acadaemy of Sciences; one female, June 4, 1927, Hollister, Idaho, and one male labeled, "Ormsby County, Nevada, July 6 (Baker), cotype." The Nevada male was received in a shipment of tephritids from the Stanford University collection.

Dr. Alan Stone checked the type for the author and reports that it bears the same information as regards the date and collector as was found on the label of the previous mentioned Nevada specimen, the other information being as originally given by Coquillett. The "cotype" designation is treated as a probable error in labeling since Coquillett mentions only one specimen in the original description.

THE GENUS ERYTHMELUS IN CALIFORNIA
(Hymenoptera, Mymaridae)

BY RICHARD L. DOUTT
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This paper is a synopsis of the species of *Erythmelus* presently known to occur in California. The author is grateful to A. B. Gahan who kindly compared series of specimens from California with the type material held in the United States National Museum.

Erythmelus flandersi Doutt, new species

Near *picinus*, but easily distinguished by having funicle segment four shorter than segment six. Differs from *gracilipes* by possessing longer funicle segments, more extensive discal ciliation on forewing, and a decidedly darker color. Antennae somewhat similar to *longicornis*, but *flandersi* has longer forewings and relatively longer basal segments of hind tarsi.

Female. Length 0.9-1.0 mm. General body-color very dark brown to black. Basal and ventral portions of abdomen lighter. Trochanters pallid. Eyes red. Wings hyaline or but slightly and indistinctly fumated.

Viewed laterally, head over twice longer than wide; face between eyes concave; fronto-vertex peaked at acute angle. Viewed frontally head as wide as long; ridge of fronto-vertex transverse between posterior ocelli; orbital lin broken in fronto-vertex area, of beaded appearance; facial line transverse, unbroken.

Antenna as in Fig. 1, A. Funicle segment 1 slightly longer than 2. Segments 2-6 gradually increase in width. Segment 4 longer than any funicle segment except 6, the largest. Club thickly clothed with small sensory setae.

Forewings long and somewhat narrow for genus. About 5 lines of discal cilia on apical third of wing. A single irregular line of short discal setae extends medianly from beneath wing venation to apical ciliation of disk. Single row of setae located near cephalic margin of wing, extending from venation to apex. Wing base normally fumated.

Posterior wings with single complete median row of cilia. Sparse row near cephalic margin, another partial row near basal caudal margin. Maculate.

Thorax long; in cleared specimens a light transverse band appears on scutum. Scutellum longitudinally striate. Apex of metanotum acutely projects dorsally.

Abdomen with prominent ventral sheath beneath ovipositor. Ovipositor and lateral valves slightly exerted.

Male. Length 1.0 mm. color as in female. Genitalia extended beyond apex of abdomen, (all specimens examined had been processed through alcohol for slide mounts). Antennae as in Fig. 1, F., filiform, each funicle segment longer than either scape or pedicel. Funicle segments with longitudinal carinae, setae arise from between carinae. Wings slightly narrower than female.

Described from 17♀ ♀ and 4♂ ♂ all captured by R C. Dickson on yellow tanglefoot boards suspended in orange trees. *Holotype*, ♀, COVINA, CALIFORNIA, May 3 to 17, 1946. *Allotype*, ♂ COVINA, CALIFORNIA, May 3 to 17, 1946. *Paratypes*, 9♀ ♀, 1♂, COVINA, CALIFORNIA, May 3 to 17, 1946; 4♀ ♀, 2♂ ♂, April 26, 1946; 1♀, PERALTA, CALIFORNIA, May 3 to 17, 1946; 1♀, E. HIGHLAND, May 1, 1946; 1♀, CUCAMONGA, CALIFORNIA, May 1, 1946.

Host unknown.

Types deposited in the collection of the Division of Biological Control of the University of California. Paratypes to be deposited with the California Academy of Sciences and the United States National Museum.

This species is dedicated to S. E. Flanders, through whose energy the first representative collection of Californian Mymaridae was assembled.

ERYTHMELUS GRACILIS (Howard)

Anaphes gracilis Howard, 1881, Rept. Ent. U.S.D.A. 1880, p. 370.
Anaphes cinctiventris Girault 1911, Trans. Amer. Ent. Soc., 37(3): 286-287. (New synonymy).

The type locality of *cinctiventris* is Mountain View, California, however, this species is believed to be synonymous with *gracilis* which has been taken in Georgia, Illinois, and District of Columbia. All the specimens examined were collected by R. C. Dickson on tanglefoot boards suspendsd in orange trees. The following localities are recorded: West Arcadia, 2♀ ♀, June 14, 1946; 3♀ ♀, August 25, 1946. Cucamonga, single females captured July 1, July 26, August 9, 1946. Covina, Calif., 1♀, August 25, 1946. East Highland 1♀, Sept. 20, 1946.

Hosts for *A. gracilis* are recorded as *Aspidiotus perniciosus* Comst., *Lepidosaphes ulmi* (Linn.), and the eggs of *Carpocapsa pomonella* (Linn.). The unusual host range indicated by these

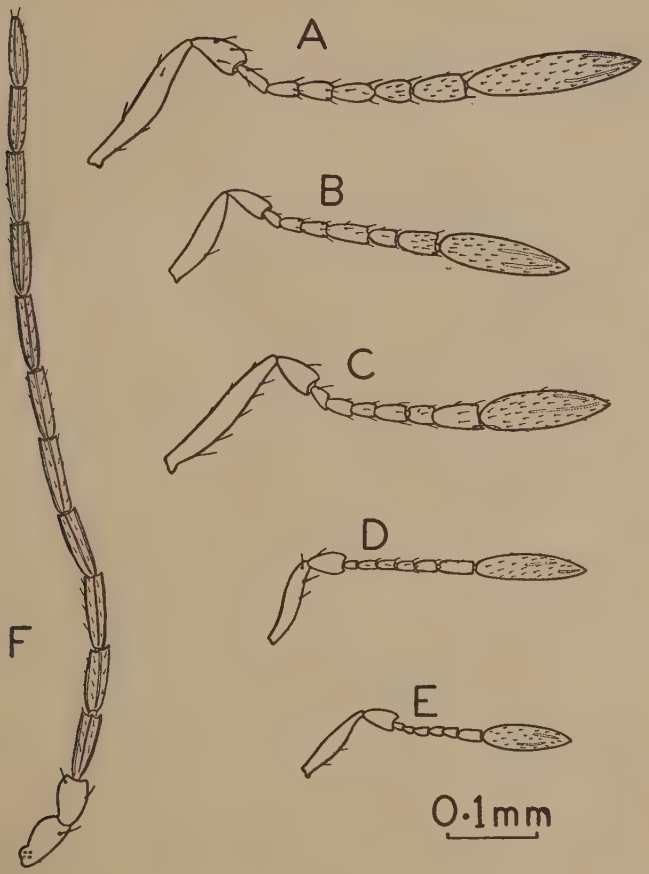

Figure 1. Antennae of Californian Species of *Erythmelus*. A. *flandersi* ♀, B. *picinus* ♀, C. *gracilis* ♀, D. *miridiphagus* ♀, E. *psalladis* ♀, F. *flandersi* ♂.

records suggests the need for confirmation through controlled rearings.

ERYTHMELUS MIRIDIPHAGUS Dozier

E. miridiphagus Dozier 1937. Jour. Agric. Univ. Puerto Rico, 21: 133.

E. miridiphagus has recently been collected along riparian areas in northern California. Otherwise this species is known only from Puerto Rico. The number of entomologists who have collected Mymaridae is small indeed, and the inadequate coverage of vast areas accounts for such spotty distributional records.

E. miridiphagus has been collected in California at the following localities: Russian River, near Forestville, 2♀♀, May 28, 1947 (Doutt); Rio Nido, 2♀♀, May, 1, 1947 (Doutt); Nicolaus, 1♀, 1♂, April 25, 1947 (Doutt).

The host of *E. miridiphagus* in Puerto Rico is asumed to be a mirid, *Polymerus cuneatus* Distant, but no actual rearings verify this supposition.

ERYTHMELUS PICINUS (Girault)

Anaphes picinus Girault, 1916. Ent. News, 27:6-7.

E. picinus was described from New Mexico and these records extend its range to California. Specimens have been collected in the following localities: Hecker Pass, 1♀, Sept. 17, 1947 (Doutt); La Manda Park, 2♀♀, April 12, 1923 (Compere); Novato, 1♀, July 3, 1947 (Doutt); Rio Nido, 1♂, May 28, 1947, 1♀, Oct. 17, 1947 (Doutt), Forestville, 2♀♀, May 28, 1947.

ERYTHMELUS PSALLIDIS Gahan

Erythmelus psallidis Gahan, 1937 Proc. Ent. Soc. Wash., 39(9): 266-269.

The species is distributed through South Carolina, Mississippi, Louisiana, Arkansas, Texas, and Arizona. The record in this paper extends its range to southern California. During 1933, in August and September, 12♀♀ and 5♂♂ specimens were collected from ragweed at Arlington, Calif., by S. E. Flanders.

E. psallidis is probably the only species of the genus with a host record that can at this time be considered entirely reliable. Its preferred host is the cotton flea hopper, *Psallus seriatus* (Reuter), but it also attacks a mirid, *Reuteroscapus sulphureus* (Reut.), as

determined through careful rearings by Ewing and Crawford (1939). On purely circumstantial evidence they also list as a host another mirid, *Macrolophus separatus* (Uhler).

Erythmelus io (Girault)

Anagrus io Girault, 1911 Trans. Amer. Ent. Soc., 37(3):294-295.

Girault described this species from a single male taken in Illinois and he appended the description with a statement that a similar tag mounted male was found in the National Museum collection with a locality label of Los Angeles County California. However, this specimen differed from the type, *io*, in wing coloration. Girault later suggests that *io* is similar to *cinctiventris* and cannot be defined very well.

It is possible that *io* is a valid species and is present in California, but none of the specimens which have been examined are recognizable as this species. It is also possible that the female of *io* is described as an entirely different species. The status of *io* is considered too doubtful to warrant its inclusion in the following key.

Key to Californian Species of Erythmelus

Females

1. Funicle segment 4 shorter than segment 6 2
– Funicle segment 4 equal to or longer than segment 6 ..... *picinus*
2. Species small, funicle segment 1 small, less than half length of funicle 6 3
– Species large, funicle segment 1 over half length of 6 ..... *flandersi*
3. Basitarsus only slightly longer than second tarsal segment 4
– Basitarsus nearly twice the length of second tarsal segment ..... *gracilis*
4. Funicle segment 5 subquadrate, Californian specimens of light color. Club about 3 times as long as broad ..... *psallidis*
– Funicle segment 5 not subquadrate, Funicle 6 almost twice length of any other funicle segment. Club 3.5 times as long as broad ..... *miridiphagus*

Literature Cited

Ewing, K. P. and H. J. Crawford. 1939. Egg parasites of the cotton flea hopper. Jour. Econ. Ent., 32(2):303-305.

RECORD OF A FUNGUS OUTBREAK AMONG ADULT BEES OF THE GENUS ANDRENA

(Hymenoptera, Andrenidae)

BY GEORGE E. BOHART[1]

U. S. Legume Seed Research Laboratory, Logan, Utah

On May 19, 1934, near Trinity Center, Trinity County, California, various wild bees were observed collecting pollen from a dense stand of the buttercup, *Ranunculus californicus* Benth. It was the densest population of bees on flowers that I have ever observed, each flower seeming to have one or more visitors. A few sweeps of the net often collected fifty or more specimens. *Andrena complexa* Viereck was the dominant bee, but a species of *Panurginus* was also quite abundant. A *Nomada*, presumably parasitic on the *Andrena*, was likewise common.

Subsequently for a few days the weather was cool and showery, but cleared by May 23 to the extent that bees reappeared in their former abundance. A few *A. complexa* bees were seen to be dead and still clinging in life-like position to flowers and stems of the buttercup. Resemblance of these bees to syrphid flies killed on plants and to house flies killed on walls by the entomophagous fungus *Empusa* was at once apparent. The clinging posture and swollen abdomens showing white beneath the intersegmental membranes were unmistakable. Within two days living bees were rare, but on every *Ranunculus* plant there were several to many bees that had been killed by the fungus. Remarkably, the other species of bees appeared to be immune. Syrphid and emidid flies, the latter often seen feeding upon various small bees, were likewise unaffected.

I am unaware of previous reports of fungus epidemics in the field among adult bees. At the time of observation, however, I did not realize that the situation was unusual and made only the superficial observations given above. It would be interesting to know whether others have observed similar outbreaks among bees.

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[1]Bureau of Entomology and Plant Quarantine, Agr. Res. Admin., U. S. D. A.

NOTES ON A LITTLE KNOWN WORK BY PH. F. GMELIN PUBLISHED IN 1758 WHEREIN HE DESCRIBES SOME NEW SPECIES OF APHIS

BY F. C. HOTTES
Grand Junction, Colorado

In *Fauna Suecica* published in 1746 Linnaeus named and described seventeen species belonging the the genus *Aphis*. Of the seventeen species treated in this work all but three were named as binomials. Because this edition of Fauna Suecica was published before 1758 the names and species described in this work would have no validity in our present system of nomenclature had not Linnaeus made some of them valid by reuse in the tenth edition of his *Systema Naturae*. The species thus treated were: *Aphis ribis, Aphis ulmi, Aphis pistinacae, Aphis sambuci, Aphis rumicis, Aphis rosae, Aphis tiliae, Aphis betulae,* and *Aphis pini*. In this edition of the Systema Naturae four species listed in Fauna Suecica were assigned new names. Thus *Aphis cucubali* became *Aphis lychnidis, Aphis serratulae* became *Aphis cirsii, Aphis artemisiae* became *Aphis absinthi,* and *Aphis centaureae* became *Aphis jaceae*. The trinomial which in this edition of *Fauna Suecica* was described on page 387 in the appendix and given the name *Aphis populi nigrae,* became *Aphis bursaria* in the tenth edition of the *Systema Naturae,* and for some reason *Aphis aceris* and *Aphis plantarum aquaticarum* were not treated but were left by Linnaeus to be described in the second edition of *Fauna Suecica* which was published in 1761. *Aphis aceris* being given the same name and *Aphis plantarum aquaticarum* becoming *Aphis nymphae.*

Joh. Aug. Ephraim Goeze in his *Entomologische Beyträge zu des Ritter Linné Zwölften Ausgabe des Natursystems,* Band II, published in 1778 frequently gives as reference, *Onomat. hist. nat. P. I.* in connection with the species belonging to the genus *Aphis* which he treats. This reference unique in aphid literature, so far as I am aware, aroused my interest.

After failing to locate this work in this country in 1932 I wrote to the late Dr. Walter Horn then Direktor of the Deutsches Entomologisches Institut der Kaiser Wilhelm Gesellschaft. I asked him to try and locate the work for me, and if successful to send me photostats of the pages on which the genus *Aphis* was treated.

Dr. Horn answered almost at once, saying that he had never seen a copy of the work but that he would try to locate one in Germany. He was able to give me the following citation: Ph. F. Gmelin, *Onomatologia medica completa seu onomatologia historiae naturalis oder vollstandiges Lexicon das alle Benennungen der Kunstworter der Naturgeschichte nach ihrem ganzen Umfang erklärt. Ulm*, 1758-1777, 7 vols. (vols. 5-7 are by G. F. Christmann). This work is not listed by Hagen in his *Bibliotheca entomologica*. It is listed by Horn and Schenkling in their *Index Litteraturae Entomologicae* but they make no mention of Christmann. The British Museum catalogue of printed books lists Christmann as the author of vols. 5-7 of this work. Recently I have located a copy of this work by Gmelin in the Army Medical Library, Cleveland Branch (there is also a copy in the library of the British Museum) but I have seen only photostats of the title page of vol. 1 and of the columns devoted to *Aphis*. These were kindly sent me by Dr. Horn, a number of years ago.

For practical reasons the tenth edition of the Systema Naturae is assumed to have been published on January 1, 1758. Thus we must assume that Gmelin published his work after that of Linnaeus. There is ample evidence, however, that Gmelin was not familiar with the tenth edition and that Linnaeus was not familiar with the work of Gmelin. As proof one might cite the use of such terms as *artemisiae*, *serratulae*, and *centaurae* for species by Gmelin which had been used for species by Linnaeus in *Fauna Suecica* but which were not used by him for species in the tenth edition. One might also offer as proof that Gmelin was not familiar with the tenth edition, the species described as new in this work by Linnaeus of which Gmelin makes no mention. Of the works of Linnaeus which I have seen, no mention is made of Ph. F. Gmelin, or his species, the names of which were quite obviously taken from the edition of *Fauna Suecica* published in 1746.

Of the twenty names which Gmelin associates with the name Aphis, only *populi nigrae*, *ribis*, *sambuci*, and *tiliae* are associated with the name of Linnaeus. If Gmelin's borrowed names which he associated with quite adequate descriptions may be credited to him, and apparently they may according to the rules of Zoological Nemenclature the species treated by him may be considered as follows:

Aphis aceris Gmelin 1758, first valid use as a binomial. *Aphis aceris* L. 1761 is a homonym.

Aphis aceris as described by Linnaeus is generally considered to have been a composite species and there is no reason for thinking that the species described by Gmelin was otherwise.

Periphyllus aceris L. and *Periphyllus testudinatus* Thornton following Kessler Van Der Goot and Theobald would appear to be very difficult to separate except on the characters offered by their dimorphic forms. *P. testudinatus* having marked foliate lateral plates in the dimorph which are lacking in the dimorph of *P. aceris* but replaced in part by long dark hairs. Perhaps it will be less confusing to consider *Periphillus aceris* Gmelin to be the same species that in the restricted sense has been considered *Periphyllus aceris* (L.).

Aphis artemesiae Gmelin, 1758, first valid use as a binomial but a synonym of *A. absinthi* L.

Aphis betulae Gmelin 1758, *Aphis brassicae* Gmelin 1758, *Aphis cardui* Gmelin 1758 are homonyms of species described by Linnaeus in the tenth edition of the Systema Naturae. Both Linnaeus and Gmelin describe *A. betulae* as without wings and appendages. Linnaeus did not describe *A. brassicae* in the first edition of Fauna Suecica but in the 10th edition of Systema Naturae. The fact that Gmelin made use of the name *brassicae* can be taken as an indication that he was familiar with the 10th edition.

Aphis centuareae Gmelin 1758, first valid use as a binomial but a synonym of *Aphis jaceae* L.

Aphis centureae Koch is a homonym and will require a new name.

Aphis cucubali Gmelin 1758. first valid use as a binomial but a synonym of *Aphis lychnidis* L.

Aphis cucubali Passerini is a homonym and will require a new name.

Aphis nymphae Gmelin 1758, first valid use as a binomial. *Aphis nymphae* L. 1761 is a homonym as well as a synonym.

Aphis pistacinacae Gmelin is a synonym of *A. pistacinaceae* L.

Aphis pistaciae Gmelin 1758, first valid use as a binomial. The species is a synonym of *Aphis bursarus* L. *Aphis pistaciae* L. 1767 is a homonym of the species described by Gmelin. Schumacher 1921 considers *Pemphigus utricularius* Passerini to be a synonym of *A. pistaciae* L. Schumacher places *Aphis pistaciae* L. in the genus *Baizongia* Rondani, following Rondani who had made it the type of his genus. Schumacher also makes the genus *Pemphigella* Tullgren a synonym of *Baizongia*. If Schumacher is correct

in his species synonymy *P. utricularius* Pass. appears to be the first available name to replace that proposed by Linnaeus. However, I choose to follow Mordvilko 1935 who considers *utricularius* Pass. to belong to the genus *Geoica*. This being the case it is most unlikely that the species described by Passerini is a synonym of the species described by Linnaeus. In this paper Mordvilko considers *Baizongia* and *Pemphigella* as synonymous but he gives preference to and uses *Pemphigella*. It is also in this paper that Mordvilko places *Tychea setariae* Pass. *Endeis carnosa* Buckton and *Geoica squamosa* Hart as synonyms of *Geoica utricularia* (Pass.). This synonymy had in part been indicated by Horvath (*Tychea setariae* Pass. and *Geoica squamosa* Hart) as early as 1896. If one follows Mordvilko there appears to be no species which has been declared a synonym of *A. pistaciae* L. Therefore, a new name is necessary. To honor the memory of one of my former Professors and the Nestor of American Aphidologists, I propose the name Baizongia oestlundi *nom. nov.* to replace that of *Baizongia pistaciae* (L.)

Aphis ribis credited to Linnaeus.

Aphis rosae Gmelin 1758 and *Aphis rumicis* Gmelin 1758 are homonyms as well as synonyms of species described by Linnaeus.

Aphis sambuci credited to Linnaeus.

Aphis serratula Gmelin 1758 first valid use of the term as a binomial but the species is a synonym of *Aphis cirsii* L. *Aphis serratula* Schrank is a homonym and will require a new name. *Aphis serratulae* Kaltenbach is also a homonym of the species described by Gmelin. Lambers has biven the name *Dactynotus marcatus* to the species described by Kaltenbach. Dr. Lambers thought of Kaltenbach's species as a homonym of the species described by Schrank.

Aphis tiliae credited to Linnaeus.

Aphis ulmi Gmelin 1758 is a homonym as well as a synonym of the species described by Linnaeus.

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A NEW SUBSPECIES OF PTEROMBRUS RUFIVENTRIS (CRESSON)

(Hymenoptera, Tiphiidae)

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In 1938 (Trans. Amer. Ent. Soc. 64: 236-8) I considered that *Pterombrus rufiventris* (Cresson, 1872. Trans. Amer. Ent. Soc. 4: 201; described as *Myzine*) was not divisible into discrete subspecies. Additional specimens have been available recently, and I have now concluded that this species will have to be divided into two subspecies. Males from western Texas, Arizona, and California have much paler wings and are slightly smaller (10 mm. avg. length) than males from eastern Texas, Louisiana, North Carolina, and Virginia which have the wings strongly infumated with brown and are slightly larger (12 mm. avg. yength). Females of the eastern form have dusky wings, while those of the western form have pale wings except the apical third of the forewing and a cloud along the basal vein darker.

The type of *rufiventris* (Cresson) is a male of the dark-winged eastern form. It was collected in Dallas Co., Texas. The Virginia, North Carolina, Louisiana, and Texas (Lufkin) specimens recorded by me in 1938 all belong to *rufiventris rufiventris*.

The western race, which I designate here as *Pterombrus rufiventris hyalinatus* Krombein, new subspecies, agrees in details of sculpture with the typical subspecies, but is readily distinguished by the paler wings, and the generally smaller size of the male. I have seen only one female of each subspecies; that of the typical subspecies is 13.0 mm. long, and that of *rufiventris hyalinatus* is 14.8 mm. long.

Type: ♂; Presidio, Texas; June 25, 1945; (P. A. Glick; on cotton). [U. S. National Museum, Type No. 58970.] The type is 10.7 mm. long.

Allotype: ♀; Palo Verde, Imperial Co., California; August 31, 1946; (P. D. Hurd). [California Insect Survey].

Paratypes: 1 ♂; same data as type. 1 ♂; El Paso Valley, Texas;

July 31, 1947; (L. W. Noble; on alfalfa). [Both U. S. N. M.] 1 ♂; Arizona; [A. N. S. P.]. 1 ♂; Blythe, California; July 30, 1947; (Ray F. Smith; on alfalfa); [California Insect Survey]. 1 ♂; Experiment Farm, Imperial Co., California; June 1, 1912; (J. C. Bridwell; visiting glandular hairs on leaves of *Helianthus annuus*); [K. V. K.]. Paratypes vary in length from 9 to 11 mm.

Specimens from Chilpancingo, Guerrero, Mexico, and Baja California, recorded respectively by Cameron, 1894 (Biol. Centr.-Amer., Hym. 2: 258, pl. 12, fig. 23), and Fox, 1895 (Proc. Calif. Acad. Sci. (2) 5: 263, pl. 21, figs. 1-5), are probably referable to *rufiventris hyalinatus*.

A METHOD FOR COLLECTING MALE STYLOPS

(Coleoptera, Stylopidae)

BY J. W. MAC SWAIN
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Males of the Stylopidae are generally uncommon in insect collections, more particularly those genera which are parasitic on solitary nesting Hymenoptera. For this reason, results obtained from using females of *Stylops pacifica* Bohart to attract large numbers of males may be of interest.

S. pacifica is a relatively common parasite of *Andrena complexa* Viereck and *A. suavis* Timberlake. These two bees, which occur throughout Northern California and Oregon from sea level to about 7000 feet, are apparently limited in their pollen collecting habits to the flowers of *Ranunculus*. At lower elevations emergence of the bees varies from the middle of February to the middle of March depending on the season. Almost one hundred percent of the first individuals to appear in any one locality are parasitized by *S. pacifica*. The parasites are very conspicuous, since they protrude from between the posterior abdominal tergites of their host. The female has her flat, brown, triangular cephalothorax exposed while the male is recognizable by its larger, darker, oval puparium. On the first warm day after the appearance of the bees the male Stylops emerge from their puparia. These males are capable of immediate flight and have been observed to live only a few hours. However, males may be enocuntered in the field over a period of a week to ten days.

The ability of female insects to attract males hasbeen used by collectors with varying degrees of success in many groups, but its use for the capture of male Stylops has not been reported. In the spring of 1947 a study of the mating behavior of *S. pacifica* was undertaken. For this study a number of bees containing the female parasite were placed on flowers and on several occasions males appeared within a few minutes. In 1948 emergence of the bees was first noted on February 16 when 7 male Stylops were collected in one hour by placing bees containing female parasites on the flowers. The following day, which was somewhat overcast, the same method gave negative results. On the next clear day, February 20, 193 males were taken by two collectors in two and one half hours. Of this number 111 were captured by one collector using a single *Andrena complexa* which contained a female parasite. After three days of inclement weather collecting was resumed with the stylopized bees confined in small cages. The cages consisted of a three inch tube of cloth with a cork stopper inserted in each end. In this experiment each parasitized bee was immobilized by lightly crushing its thorax. The bee was then pinned through the thorax and the pin inserted into the smaller end of the cork within the cage. Three such cages were set out at intervals of about two hundred feet and visited regularly over a period of two hours. During this time 263 males were collected either on or flying about cages. In this experiment it was found that the cages were very effective when set out on barren ground away from surrounding flowers.

The greatest difficulty in this technique is the problem of obtaining female parasites which will attract the males. Of the total of 152 female Stylops collected in 1948 only 8 were found to be attractive to males at the time of capture. However, the bees which were captured earliest in the morning contained the greatest percentage of females which could be used for trapping. At the time that the 152 female Stylops were taken, bees containing the empty puparia of 269 male Stylops were collected. In contrast to the number of empty puparia observed, a total of 510 males of *S. pacifica* were attracted by the use of the 8 females.

R. M. Bohart in his 1941 revision of the Strepsiptera reports known males for about half of the North American species of the genus *Stylops*. If it is found that this trapping method can be applied to other members of this genus the number of species from which males are known may be increased.

NOTES ON THE OCCURRENCE OF AGROMYZID FLIES DURING 1948, AND A RECORD OF TWO UNREPORTED SPECIES IN CALIFORNIA

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During the summer and fall of 1948 in different sections of California, several species of leaf-mining flies of the family Agromyzidae were exceedingly abundant and caused serious damage to truck and field crops. They also selected a wide range of plants of little economic importance. In the past the commonest species causing damage to various truck and field crops has been reported as the serpentine leaf miner, *Agromyza* (or *Liriomyza*) *pusilla* Meigen. It is now apparent that several species are involved. In the Sacramento and San Joaquin valleys of California where it is hot and dry during the summer, the common species causing damage to alfalfa, beans, melons, and tomatoes is a small species with a yellow scutellum, *Agromyza* (*Liriomyza*) *subpusilla* Frost (orig. desc., Jour. New York Ent. Soc. 51: 255-56, 1943) which has been previously unreported in the state. The specimens were determined by Dr. S. W. Frost and Dr. C. W. Sabrosky. This miner also selects a number of plants of little economic importance. Along the coast of California, in the coastal valleys, and in areas having a coastal influence, this species is replaced by a larger species, also with a yellow scutellum, which is close to the European *Agromyza* (*Liriomyza*) *flaveola* Fallen (also has been called *A. orbona* Meigen). During 1948, this species damaged cruciferous crops, lettuce, melons, peas, sugar beets, tomatoes, and cultivated flowers, and, in addition, selected many hosts of no economic importance. Through the courtesy of Dr. R. N. Jefferson, I was able to examine flies from southern California damaging tomato and found them to be close to or equal to *Agromyza* (*Liriomyza*) *pusilla* Meigen. This would indicate that we have three species in California with a yellow scutellum which cause damage to a wide range of plants.

The corn blotch miner, *Agromyza parvicornis* Loew, is a widely distributed fly, but no definite records in the literature could be found for the occurrence of this insect in California. During

August, 1948, it was found damaging young corn at Davis, Yolo County. The characteristic blotch mines caused some drying up of the tips of the leaves, and the damage was accentuated by the persistent, white, feeding punctures of the females. The fly was determined by Dr. C. W. Sabrosky.

NOTES ON SOME FOREST INSECTS OF BAJA CALIFORNIA

By F. P. Keen

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In the Northern District of Baja California, Mexico, about 80 miles below the United States border lies the mountain range of San Pedro Martir, rising to an elevation of over 10,000 feet and carrying extensive forests of pine, fir, cedar and oak. These forests are separated from similar forests of the Sierra Madre in southern California by approximately 100 miles of open, non-timbered, brush-covered hills, with only a few intervening patches of Jeffrey pine, Parry piñon and oak.

For many years it has been of interest to know whether or not the trees on this botanical island were infested with the same species of insects found associated with their counterparts north of the border. In late October and early November of 1947, an opportunity to collect forest insects from this region was afforded the writer, who accompanied J. W. Duffield and Wm. C. Cummings, of the Institute of Forest Genetics, on an expedition to collect specimens of seeds, cones, leaves and insects from the trees on this mountain range.

Tree species found on San Pedro Martir included Jeffrey pine (*Pinus jeffreyi*), sugar pine (*Pinus lambertiana*), lodgepole pine (*Pinus contorta*), *Parry piñon* (*Pinus parryana*), white fir (*Abies concolor*), and incense cedar (*Libocedrus decurrens*). Nearer the coast on the bluffs of San Vicente canyon, near the village of

San Isidro, Bishop pine (*Pinus muricata*) was found, and in the mountains east of Ensenada collections were made from knobcone pine (*Pinus attenuata*).

The distance traveled by horseback to reach San Pedro Martir and the lack of feed for stock made it impossible to spend more than one day on the mountain. Hence, it was impossible to make comprehensive collections from all tree species. Sufficient collecting was done, however, to establish the fact that the native trees on this isolated mountain had associated with them the same insects as found associated with these tree species in California to the north. Isolation had proved no barrier.

Species collected, all of which apparently are new records for Baja California, were as follows:

Pinus jeffreyi

Dendroctonus jeffreyi Hopk.[1] (New attacks under bark).
Dendroctonus valens Lec.[1] (Attacking base of trees).
Ips emarginatus (Lec.)[1] (Under bark).
Melanophila californica Van. D (Larvae only, under bark).
Hylurgops subcostulatus (Mann.)[1] (Under bark).
Orthotomicus ornatus Sw.[1] (Under bark).
Gnathotrichus retusus (Lec.)[1] (In sapwood).
Plegaderus nitidus Horn.[2] (Under bark).
Glischrochilus sp. (apparently undescribed)[3].
Xantholinus sp.[5].

Pinus lambertiana

Dendroctonus monticolae Hopk.[1] (Under bark of windfall).

Pinus muricata

Carphoborus sp.[1] (Attacking bark of trunk and limbs).
Eucrossus villicornis Lec.[4] (Reared from wood).

Abies concolor

Scolytus ventralis Lec. (Work noted on bark and sapwood).
Xylotrechus abietis Van D.[4] (Reared from wood of trunk).

Quercus agrifolia

Pseudopityophthorus sp. prob. *pubipennis* (Lec.[1]) (Under bark).

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[1]Identifications checked by W. H. Anderson, U. S. Bureau of Entomology and Plant Quarantine.
[2]Identified by H. S. Barber, U. S. Bureau of Entomology and Plant Quarantine.
[3]Identified by E. A. Chapin, U. S. National Museum.
[4]Identified by E. Gorton Linsley, University of California.
[5]Identified by R. E. Blackwelder, U. S. National Museum.

OCCURRENCES OF DIURNAL LEPIDOPTERA AT LIGHT

By J. W. Tilden
San Jose, California

It has long been noted that certain normally diurnal insects, including representatives of several orders, are occasionally attracted at night to light. Among these insects, a number of butterflies is included, although these species are, at least in our fauna, normally entirely diurnal. The literature on this subject is fairly extensive, and has not been examined exhaustively here, but of special interest is an article by Howard (1898), which reviews a number of papers on the subject. Among the species mentioned in this article as having been taken at light are *Epargyreus tityrus* (Fabr.), *Pholisora catullus* (Fabr.), *Vanessa atlanta* (L.), *Vanessa cardui* (L.), *Vanessa virginiensis* (Drury), *Nymphalis j-album* (Bdv. & Lec.), *Nymphalis antiopa* (L.), *Asterocampa celtis* (Bdv. & Lec.), *Danaus plexippus* (L.), *Papilio troilus* L., and *Lycaenopsis pseudargiolus* (Bdv. & Lec.). Dr. Howard suggests that in some cases these captures may be due to the diurnals going to sleep nearby, and upon being disturbed by some means, they subsequently fly to the light.

Tilden and Mansfield (1942) mention the capture of a specimen of *Lerodea eufala* (Edw.) at light in San Jose, Calif., where this species appears to be uncommon. Other observations so far unrecorded may be included here. In 1931, during both the spring and the fall periods of flight of the skipper, *Poanes melane* (Edw.), several specimens of this species were taken at the lights of the pumping plant on River St., in Santa Cruz, Calif. In each case, the insect was sitting near the light, not fluttering around it. It may be worthwhile to note that in the grounds around the pumping plant, grew *Scabiosa*, *Salvia*, *Aster* and other flowers, attractive to this skipper during daylight hours.

At Vineburg, Sonoma County, Calif., *Ochlodes agricola* (Bdv.) was taken, one male at the lights of a service station, in June, 1933. In September, 1936, another member of this genus, *Ochlodes sylvanoides* (Bdv.), was taken, also at the lights of a service

station, at Gustine, Merced County, Calif. In these two instances, as in the foregoing, the insects were merely sitting near the lights. None of these skippers was observed actually flying to the light.

At Salida, Stanislaus County, Calif., in October, 1932, three specimens of *Vanessa cardui* (L.) were taken, two at the lights of a service station and one at the lights of an auto court. At the same time, a number of specimens of *Colias eurytheme* Bvd. were seen. Both of these species were fluttering actively around the lights.

The latest of such occurrences to be noted was the capture of a specimen of *Vanessa caryae* (Hbn.) at the porch light of a private home near Navarro, Mendocino County, Calif., on the evening of October 3, 1947, at about 9:30 p.m. This specimen was fluttering against the lamp globe of the light.

A tabulation of these records shows several interesting things. The family Nymphalidae is best represented by seven species. The family Hesperiidae is second with six species. Pieridae, Papilionidae, Danaidae, and Lycaenidae are represented by one species each. No Satyridae nor Riodinidae are included. From this it might be concluded that Nymphalidae and Hesperiidae are more susceptible to attraction to light at night than are other families of butterflies. It is also to be noted that in most of the recorded cases, the insects are of common species. It is even more noticeable, however, that some of the most common species are conspicuously absent.

Moreover, all the American species of *Vanessa* have now been recorded as having been captured at light. This is rather remarkable, since this is the only genus, all the species of which have been taken under these circumstances, and it is a matter of interest that behavior so unusual in butterflies should be common to all the members of any given genus in our fauna.

Whether or not Dr. Howard's explanation may be taken to be a valid one is hard to prove or to disprove, but the widespread occurrence of this phenomenon, together with the grouping of captures mostly in two families, would suggest that his is at most only a partial explanation. The habit of being attracted to light would appear to be, in butterflies, a reaction occurring in a relatively small percentage only of the individuals of a species. If the reaction were actually common to a species, one would expect

to find records of many more individuals taken in this manner, or it would have become a matter too well known to be considered curious.

Actually, phototropic behavior varies not only in butterflies, but also in moths. A tabulation of phototropism in moths in any locality would probably show that there are numerous species indifferent to light, and a certain percentage of definitely negative species. Among moths of the latter category may be mentioned members of the genus *Triphosa*, which shun light. At Tucson, Ariz., in April, 1938, it was found that the phalaenid, *Ulosyneda valens* Hy. Edw. was common at the flowers of *Rhus trilobata* Nutt., but indifferent to the light of a Coleman lantern in the immediate vicinity. The rather closely related *Litocola sexsignata* Harv., which was abundant in the same area, was purely diurnal, and was not taken at light. Many other similar examples could be given.

The problem of phototropism is Lepidoptera is far from a simple one. It may be observed that the occurrence of butterflies at light is unusual enough to be of interest, but still by no means so rare as might be supposed.

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Line 12, p. 171. This should read:
elegans Cr. and further studies may show the *E. hespera* Scullen,

Figure 14, p. 177. The title should read:
Fig. 14. Distribution map for *E. velutina* (2), *E. melanovittata* (4), *E. mellea* (5), *E. hespera* (8), *E. ruficaps* (10), *E. baja* (7), and *E. pacifica* (11).